

# Early Childhood Overweight: Disparities, Predictors, and Consequences

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1

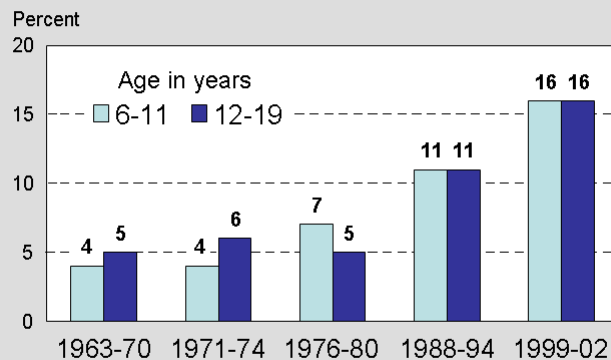
## Motivation

- “Obesity epidemic” in the US
  - Overweight among US kids increased 100%+ since 1971
  - (unadjusted) Racial Differences
    - Ages 6-11 in 1999-2000
    - Hispanic children – 22%
    - non-Hispanic black children—20%
    - non-Hispanic white children-14%
  - Health problems/medical costs
    - Type 2 Diabetes, future cardiovascular disease

2

## “Obesity Epidemic”

**Figure 1. Prevalence of overweight among children and adolescents ages 6-19 years**



NOTE: Excludes pregnant women starting with 1971-74. Pregnancy status not available for 1963-65 and 1966-70. Data for 1963-65 are for children 6-11 years of age; data for 1966-70 are for adolescents 12-17 years of age, not 12-19 years. SOURCE: CDC/NCHS, NHES and NHANES

3

## Motivation (cont'd)

- Obesity is an “absorbing state”
  - Few transitions out of overweight/obesity status
  - Cross sectional evidence is of limited value
    - Difficult to establish proximal causes
    - Problem of reverse causality

4

## Obesity as Absorbing State

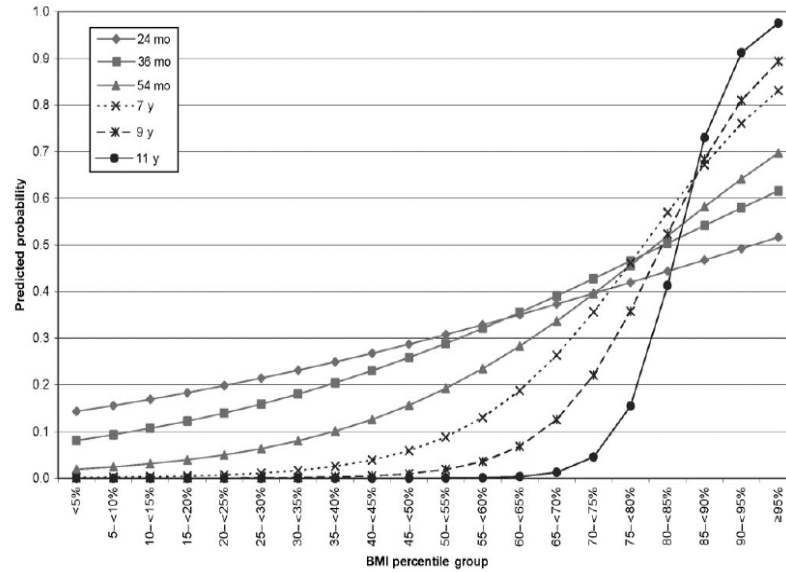


FIGURE 1  
Predicted probabilities of age-12 BMI  $\geq 85\%$  as a function of 24-, 36-, 54-month or 7-, 9-, or 11-year BMIs.

Source: Nader et al. 2006 Pediatrics

5

## Motivation (cont'd)

- Examine transitions into overweight/obese
  - This happens very early
    - Most current research focuses on 5+ ages
  - Most datasets are “too late”
    - 13%+ of adolescents are overweight
    - 8%+ of 4-5 years olds are overweight
    - Exceptions
      - Fragile Families (disadvantaged families)
      - NICHD Early Child (N=1,000, 10 sites)
      - ECLS-K (a little late)
      - ECLS-B

6

## Research Questions

- Focus on overweight status at 2-years old
- Are there racial differences in early overweight status?
- What individual/family factors predict early overweight status?
- Is early overweight status associated with early cognitive/motor skills?

7

## Background Literature

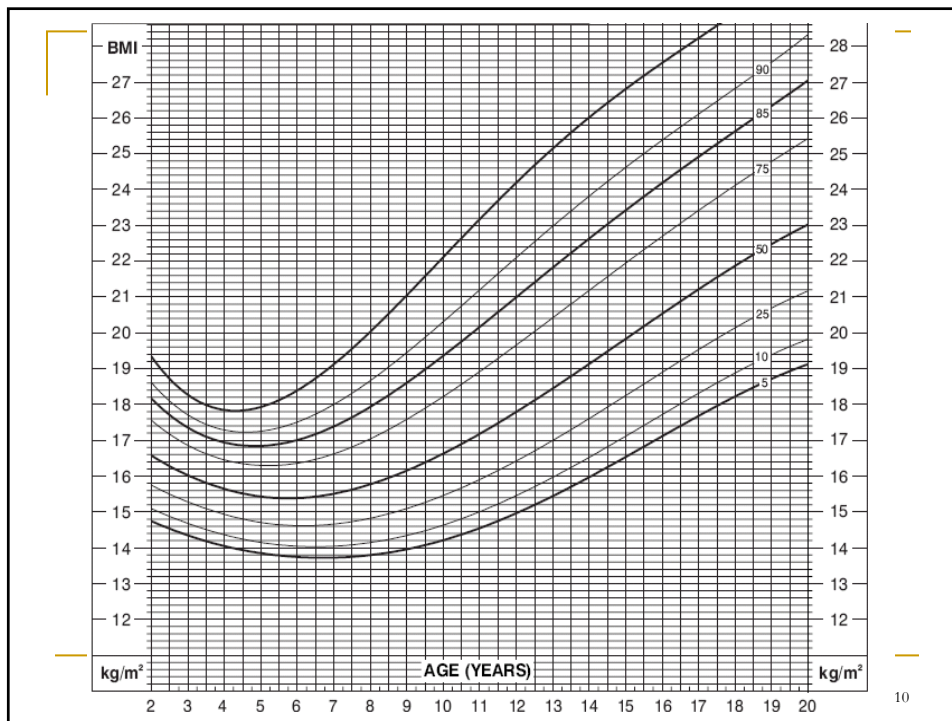
- Large literature on older children/adolescents
- Literature on young children is small
  - Kimbro, Brooks-Gunn, McLanahan (2007 AJPH) using Fragile Families
    - National sample of relatively disadvantaged families (“fragile”)
    - Cannot explain minority-white gaps in overweight
      - 14% white obese (34% overweight/obese)
      - 17% black (34%)
      - 24% Hispanic (44%)

8

## Data

- ECLS-B
- Overweight status/at risk status cutoffs for 2 year olds from CDC growth charts
  - By age/gender
  - Controversial
- Drop individuals with missing height/weight or other data (leaves N=8,500)
  - N = 7,600 with valid Xs
- Include information from child, family, community, and birth certificate

9



10

## Child Characteristics (N=7,600)

Variable	Mean	Std. Dev	Min	Max
<b><u>Child Information</u></b>				
Overweight	0.15	0.36	0	1
At Risk	0.13	0.34	0	1
BMI	17.34	2.22	10.3	36.3
Age (months)	24.42	1.19	20.9	38.2
Male	0.51	0.50	0	1
White	0.44	0.50	0	1
Black	0.16	0.37	0	1
Hispanic	0.20	0.40	0	1
Asian	0.10	0.30	0	1
Multi-Race	0.08	0.27	0	1
Other Race	0.03	0.16	0	1
Low Birth Weight	0.16	0.36	0	1
Very Low Birth Weight	0.10	0.30	0	1
Twin	0.16	0.37	0	1

11

## Family Characteristics

<b><u>Family Information</u></b>				
Maternal Age	28.61	6.40	15	51
Maternal Education	13.75	2.70	8	20
Married Household	0.67	0.47	0	1
Maternal Employment (FT)	0.33	0.47	0	1
Maternal Employment (PT)	0.19	0.39	0	1
Maternal Unemployment	0.08	0.27	0	1
ESL Status	0.20	0.40	0	1
SCHIP Status	0.09	0.28	0	1
Medicaid Status	0.40	0.49	0	1
Smoking Status	0.19	0.40	0	1
Rural Status	0.15	0.36	0	1
WIC	0.41	0.49	0	1
Food Stamps	0.21	0.41	0	1
Welfare	0.09	0.29	0	1
Move Between Waves	0.34	0.47	0	1
<b><u>Family Practices</u></b>				
Breast Fed	0.69	0.46	0	1
Cries for Food/Toy	1.57	1.04	0	3
Used Baby Books	0.70	0.46	0	1
Read to Child	2.72	1.03	1	4
TV Hours/Week	1.61	1.34	0	14
Eat at Regular Time	5.49	2.14	0	7
Play active games	2.30	1.17	1	6
Play/Walk Outside	2.84	1.39	1	6
Feed When Hungry (vs. Schedule)	0.65	0.48	0	1
Number of Well-Baby Checkups	5.60	2.66	0	20
Ultrasound	0.90	0.30	0	1
Smoke in 3rd Trimester	0.73	3.19	0	100

12

## Results: Overweight Status at 2 years old Racial Differences

Outcome	Overweight	Overweight	Overweight
Sample	Full	Full	Full
Male	1.073 (0.405)	1.069 (0.427)	1.074 (0.400)
Black	1.219 (0.074)+	1.057 (0.664)	0.987 (0.922)
Hispanic	1.435 (0.000)**	1.285 (0.034)*	1.082 (0.571)
Asian	0.948 (0.765)	1.021 (0.908)	0.864 (0.487)
Multi-Racial	0.662 (0.033)*	0.622 (0.016)*	0.603 (0.011)*
Other Race	1.633 (0.057)+	1.399 (0.198)	1.263 (0.393)
Maternal Education		0.959 (0.024)*	0.970 (0.128)
Married Household		0.826 (0.059)+	0.797 (0.026)*
ESL Status			1.448 (0.011)*
Observations	7500	7500	7500

Logit Regression: Odds Ratio (p-values)

Additional Controls: Age in months, Age squared in all columns and birth weight, parental health, maternal BMI in column 3

13

## Results: Overweight Status at 2 years old Predictors (with community fixed effects)

### ■ Not Significant

- Family income, maternal education, television viewing, SCHIP status, parental health, eat at regular time, residential mobility, twin status

### ■ Significant

- Breast fed (-), maternal BMI (+), ESL status (+), low birth weight (-), Medicaid status (+), WIC status (-), parent smokes (+) walk/play outside (-), play chasing games (-)

14

## Results: Overweight Status at 2 years old Consequences for Cognitive/Motor Skills

Outcome	Cognitive Score	Cognitive Score	Motor Score	Motor Score
Column	1	2	3	4
Cognitive Score at 9-mths	1.153 (0.000)**	1.153 (0.000)**		
Motor Skills at 9-mths			1.061 (0.000)**	1.061 (0.000)**
Overweight	0.644 (0.248)		1.454 (0.056)+	
BMI		0.920 (0.180)		1.078 (0.030)*
Observations	7500	7500	7400	7400
R-squared	0.271	0.271	0.123	0.123

OLS regression (p-values)  
Full set of controls

15

## Limitations

- Reverse causality
- Omitted variables
- Very young children
  - Measurement of overweight status
- Non-response

16

## Results Summary

- Stylized facts
- Racial differences in overweight start early
  - Eliminated after controlling for a small number of family factors
- Corroborate and add to list of early predictors of overweight status
  - Physical activity, WIC, family factors
- No evidence that early overweight decreases cognitive and motor skill acquisition

17

## Future Directions

- Examine these questions with the next wave of data
- Examine these questions for at-risk of overweight status outcome
- Use alternative measures of overweight status

18